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# FLOODPLAIN MANAGEMENT RECONNAISSANCE STUDY REPORT

## CHICAGO HEIGHTS COOK COUNTY

U.S. DEPT. OF AGRICULTURE

SOIL CONSERVATION SERVICE

CATALOG NO. 1-1000





CITY OF CHICAGO HEIGHTS

COOK COUNTY, ILLINOIS

FLOODPLAIN MANAGEMENT

RECONNAISSANCE STUDY

Prepared by

US DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Champaign, Illinois

In cooperation with

STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

DIVISION OF WATER RESOURCES

SEPTEMBER 1987





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# CITY OF CHICAGO HEIGHTS

## RECONNAISSANCE STUDY

### INTRODUCTION

Use of floodprone areas can be a severe problem in Illinois. Urbanization and floodplain encroachment are increasing the severity of this problem. Over 800 communities in Illinois have been identified as having flood problems.

The Illinois Division of Water Resources (DWR) is the responsible state agency for urban flood control and for setting priorities of flood studies within urban areas. The Soil Conservation Service is providing assistance to the Division of Water Resources in setting these priorities. A joint coordination agreement was executed between the Division of Water Resources, State of Illinois, and the USDA, Soil Conservation Service on April 30, 1976 and revised in December 1978 to furnish technical assistance in carrying out Flood Hazard Studies. These studies are carried out in accordance with Federal Level Recommendation 3 of "A Unified National Program for Floodplain Management", and under Section 6 of Public Law 83-566. A plan of study was executed in October 1986 for reconnaissance studies for 4 Illinois communities. These reconnaissance studies will utilize existing floodplain information, historical high water profiles, and the 100 year floodplain from flood insurance studies when available. Average annual damages are estimated for the structures within the floodplain.

The study was conducted and the report provided to: 1) evaluate needs for additional future studies, 2) estimate average annual damages, 3) provide an updated estimate of the 100 year floodplain map, and 4) provide guidance and recommendations to the community for improved floodplain management.



## STUDY AREA DESCRIPTION

The City of Chicago Heights is located in southern Cook County, Illinois, about 25 miles south of Chicago, Illinois. The population of Chicago Heights is 37,026 according to the 1980 census.

The transportation facilities in the area include Lincoln Highway (US #30) and Illinois State Highway #1. Several railroad lines pass through Chicago Heights including: Baltimore & Ohio, Chicago & Eastern Illinois, Louisville & Nashville, Elgin Joliet & Eastern, Missouri Pacific, Chicago Milwaukee St Paul & Pacific, and Chessie System. There are several sidetracks of these railroads to the manufacturing and industrial districts that are concentrated in the eastern portion of Chicago Heights.

Thorn Creek and its tributaries generally flow northeast through Chicago Heights. The drainage area of Thorn Creek at Chicago Heights is 23.4 square miles. It is in the Upper Mississippi River Basin hydrologic unit #07120003, subwatershed #050.

Surface runoff in Chicago Heights is drained by several tributaries. Tributary B of Thorn Creek flows east through west and southwest Chicago Heights and joins Thorn Creek near 10th Street. Tributary A of Tributary B is a small tributary which flows through the Chicago Heights Country Club.

Other portions of Chicago Heights are drained by Butterfield Creek on the north side, Thorn Creek Tributary C and Third Creek on the northeast side, and Thorn Creek Tributary A on the southeast corner. These streams are not considered to be a part of this study because the flooding on these streams is minimal and the projected future development along them is not significant.



The study area for Thorn Creek begins at the outlet of Sauk Trail Dam and ends approximately 1500 feet north of Joe Orr Road. Most of the floodplain along Thorn Creek is in the Cook County Forest Preserve District or parks except for a residential area between 11th and 12th Streets near Park and Grant Avenues. Urban development is adjacent to the woodland area along Thorn Creek. Residential damages are estimated to begin with the 50 year frequency flood.

The study area for Tributary B of Thorn Creek begins at the outlet of an underground conduit near Lincoln Highway and Wilson Avenue and ends at the confluence of Thorn Creek in a woodland area near 10th Street upstream from Halsted Street. There is frequent street and yard flooding in this area; however, no reports of residential properties being damaged from overland flow. Tributary A of B through the Chicago Heights Country Club has minor flooding.

The average rainfall is 33 inches per year. November through February rainfall averages 2 inches per month, and March through October averages 3 inches per month. Snowfall averages 30 inches annually.

Bottomland soil along Thorn Creek is Sawmill silty clay loam. It is unsuited for crop production and urban area development unless drainage and protection from flooding are provided. Morley silt loam and Markham silt loam are moderately well drained to well drained soils on moderately to steeply sloped areas along the floodplain fringes and in the woodland, idle, and grassed areas providing a buffer to the residential areas. Martinton silt loam and Beecher silt loam are somewhat poorly drained soils in nearly level areas along ridges and in shallow depressions in the same buffer area of woodland, idle, and grassed areas between the floodplain fringe and the residential





area. This gently rolling and moderately sloped with shallow depressions type of topography carries into the residential and urban land areas that have soils that have been radically altered with pavement and buildings, the clayey Orthents complex, and the Markham-Ashkum complex. These soils range from the undulating to gently rolling Markham soils that are moderately well drained to the nearly level Ashkum soils that are poorly drained. The high clay content of these urban land soils make them hard to excavate for new construction; they have low strength and a moderate shrink/swell potential that could cause structural damage. Chicago Heights has already developed most of these areas into residential and commercial areas.

The PL-566 Little Calumet Watershed Plan and Environmental Impact Statement dated November 1978, describes the water quality in Thorn Creek below the sewage treatment plant as poor with some indication of sewage contamination upstream from the plant as well.

Thorn Creek Basin Sanitary District serves the five communities of Chicago Heights, Park Forest, South Chicago Heights, Crete, and Steger. This Sanitary District is adding Homewood to their service area soon. The addition of Homewood to the treatment facilities would add a maximum peak flow of 10 million gallons per day (M.G.D.) even during wet weather. The plant design before and after the addition of Homewood provides stormwater overflow treatment for an additional 24 M.G.D. Chicago Heights reports few septic systems. Chicago Heights has done extensive repair work to manholes, added liners to pipe, and grouting which is supposed to improve prevention of basement flooding by 60%.



## NATURAL VALUES

Eighty-seven percent of the channel length and 89 percent of the floodplain area of Thorn Creek is in the Cook County Forest Preserve District. Most of the remaining floodplain area is in a park or natural woodland area. Some common names for the wooded forest preserve areas along Thorn Creek are: Indian Hill Woods (from 26th Street to 16th Street), Woodrow Wilson Woods (from Lincoln Highway to Dixie Highway), Halsted Woods (from Chicago Road to Halsted Street), and Joe Orr Woods (from Halsted Street to Joe Orr Road). An historical site of the cabin of Absalom Wells, the first white settler in this part of Cook County, is maintained by the Cook County Forest Preserve District located north of Lincoln Highway and west of Illinois Highway #1. The forest preserve in this study area is a variety of wooded and open areas that has unique vegetation such as burr oak, large white oak, Ohio buckeye, sassafras, black gum, native orchids, lupines and ferns. Poor water quality and the adjacent urban area limit fishing on this reach of Thorn Creek, but at the time of the field review there were fishermen along the stream immediately downstream from Sauk Trail Dam at 26th Street. The availability of water, trees, and brush provides habitat for small animals such as furbearers, squirrels, songbirds and other wildlife. Modifications to the stream channel have been caused mainly by the nearby urban areas that has several bridge crossings, a large storm drain outlet from Park Forest immediately downstream of the Elgin Joliet & Eastern railroad crossing, and the close proximity of the Thorn Creek sanitary treatment facility on the east bank of Thorn Creek near Joe Orr Road.



## FLOOD PROBLEMS

The majority of the flood damages for the City of Chicago Heights is from sewer backups. Flood damages from sewer backups occurs on an annual basis. Residential damage from overland flooding begins at the 50-year frequency storm in the area between 11th and 12th Streets near Park Avenue and Grant Avenue.

Chicago Heights has been keeping an account of the complaints received from sewer backups and their locations. They estimate 500 homes have a sewer backup problem annually with an average cost of \$200 per incident for an average annual cost of \$100,000. The city has recently completed a sewer rehabilitation program that included extensive repair of manholes, addition of liners and grouting to the sewer lines that was supposed to reduce basement flooding by 60%. The sewer rehabilitation program has shown no noticeable improvement to the sewer backup problem to date.

Tributary B and Thorn Creek from Halsted Street to Joe Orr Road have significant flood problems from seepage through walls and foundation cracks, and backup through sewers. Tributary B has some areas where the channel is very small and the streets and yards flood quite easily. Local officials indicate no direct house flooding from overland flows in Tributary B.

The City has a debris trap (cleanout box) on the Tributary B channel near the 10th Street area. Because the debris trap is all enclosed, debris removal is difficult.

The city officials have expressed concern about increased flooding due to recent improvements to Lincoln Highway. Highway construction at the upper end



of Tributary B has added drainage area to this watershed. From visual observations and calls from residents, it appears that flood flows have increased with a corresponding increase in flooding.

A large storm drain outlet from Park Forest immediately downstream of the Elgin Joliet & Eastern railroad crossing of Thorn Creek. This is near the intersection of Beacon Blvd and Campbell Avenue. Hikers or fishermen have worn paths around the headwall and wingwalls of the Park Forest storm sewer outlet where they enter the forest preserve. Hazardous conditions exist where the slopes above the headwall and wingwall are very steep and slippery with a rock plunge pool below. These conditions could cause an accident with fatal results.





## PROBLEM SUMMARY

Estimated average annual damages to the city of Chicago Heights are listed below:

<u>Type</u>	<u>Number</u>	<u>Total Value</u>	<u>Average Annual Damages</u>
Homes	20	\$640,000	\$3,200
Garages/sheds	12	34,000	200
Subtotal	32	\$674,000	\$3,400

Additional problems due to flooding and wetness:

Seepage and sewer

backups: 500 @ \$200 = \$100,000

Debris Box Cleanout \$1,000

Total estimated average annual damages for Chicago Heights = \$104,400

Seepage and sewer backups are an annual occurrence in Chicago Heights.

Flooding of streets and yards is an annual occurrence along Tributary B.

Flood damage to some sheds along Thorn Creek begins at the 50-year frequency storm (2%) and significant building damages begin at the 100-year frequency storm (1%).



## EXISTING FLOODPLAIN MANAGEMENT

Chicago Heights has participated in the regular phase of the National Flood Insurance Program since November 15, 1979. The latest floodplain map being used by Chicago Heights is dated November 15, 1979.

The Little Calumet River Watershed Environmental Assessment was prepared by Bauer Engineering Inc, Chicago, Illinois, in July, 1973. This report was prepared for the SCS in developing the Chicago Metropolitan Area River Basin Plan. The Little Calumet River Watershed portion of the River Basin Plan was completed in May 1975, and included floodplain maps and profiles dated September 1975.

A PL-566 Watershed Plan and Environmental Impact Statement was prepared for the Little Calumet River Watershed in November 1978, that included floodplain information maps and profiles. The 1978 Little Calumet River Watershed floodplain maps did not adequately show the floodplain on Tributary B. The floodplain map in this report agrees with the 1979 flood insurance floodplain maps. Chicago Heights is enforcing their zoning ordinances, sediment and erosion control ordinances, and building permits authority.



## RECOMMENDATIONS

It is recommended that the City of Chicago Heights continue to participate in the National Flood Insurance Program.

Sewer backup valves and overhead sewers are the two main methods of dealing with sewer backups. There are various methods of floodproofing to deal with flooding and seepage. Illinois Department of Transportation, Division of Water Resources, has information on various floodproofing methods in its Local Assistance Series 3B Manual, "Protect Your Home from Flood Damage", and "Flooded Basements: A Homeowners Guide".

The debris trap (cleanout box) on Tributary B near 10th Street should be modified to facilitate periodic inspections and debris removal.

The City of Chicago Heights should consult with the District Engineer for the Division of Highways to determine the actual "as-built" structures that were installed as part of the Lincoln Highway improvement to determine if flow conditions were altered and assess the need for future action.

The City of Chicago Heights should work with the Village of Park Forest to make safety changes to the Park Forest storm sewer outlet to Thorn Creek. A safety railing on the headwall and wingwalls and protective fencing are methods of providing protection.



The May 1986 letter to Chicago Heights from the Thorn Creek Basin Sanitary District states the addition of Homewood to their service area would add 10 M.G.D. to their maximum peak flow. The additional 10 M.G.D. will have no significant impact on the stages on Thorn Creek. If the city feels the plant is discharging more than stated, gauging stations could be established upstream and downstream from the plant for verification. Water quality could also be checked by testing upstream and downstream from the plant. The city should check along the creek to verify all septic systems have been converted to the City's sanitary system. Separation of any combined sewer systems still in the village would help relieve the sewer plant and improve the stormwater that may be overflowing combined sewers to the creek during wet weather flow periods.

A low priority should be assigned for a future detailed floodplain management study for Thorn Creek in the vicinity of the City of Chicago Heights.



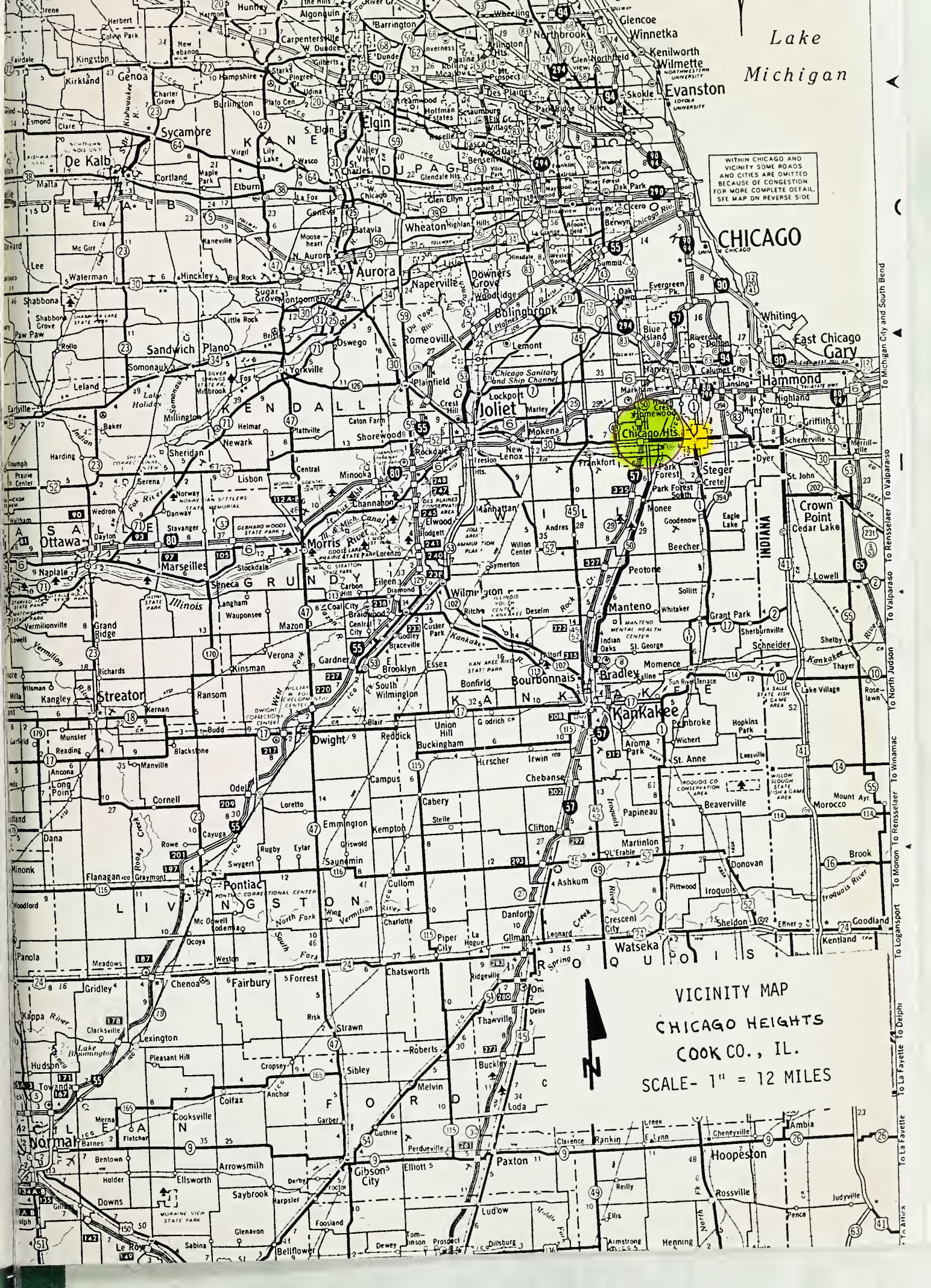


## INVESTIGATION AND ANALYSIS

No additional calculations, discharges, or profiles were made as a part of this study. The inventory of flooding and water problems were determined from a review of Little Calumet River Watershed Environmental Assessment prepared in 1973; Chicago Metro Area River Basin Report for Little Calumet prepared in 1975; Little Calumet River Watershed work plan and environmental impact statement prepared in 1978; Will County Soil Survey, 1962; Cook County Soil Survey, 1976; a field review and interviews with local citizens. The floodway and flood boundary maps, flood insurance maps and reports, river basin floodplain maps and profiles, USGS surface water gauge records, along with interviews of local citizens were used to determine the 100-year floodplain. Aerial photographs were provided by the Division of Water Resources. Damages were based on property value estimates during the field review, and the application of damage factors. These factors came from previous detailed floodplain management studies.







Lake Michigan

WITHIN CHICAGO AND VICINITY SOME ROADS AND CITIES ARE OMITTED BECAUSE OF CONGESTION FOR MORE COMPLETE DETAIL SEE MAP ON REVERSE SIDE

CHICAGO

VICINITY MAP  
CHICAGO HEIGHTS  
COOK CO., IL.  
SCALE- 1" = 12 MILES





APRIL 1987

ILLINOIS

COOK COUNTY

STREET INDEX

[illegible]

EMERGENCIES:

POLICE OR FIRE DEPARTMENTS PHONE 754-2121  
CITY HALL PHONE 756-2110  
WATER DEPARTMENT PHONE 754-0026

LEGEND

- ◆ MUNICIPAL BLDG (1-0)
- ◆ SAFETY & JUSTICE BLDG (1-0)
- ◆ DOWNTOWN PUBLIC PARKING (1-0)
- ▲ PUBLIC & PAROCHIAL SCHOOLS
- ◆ FIRE STATIONS
- ◆ POST OFFICE (1-0)
- ◆ HOSPITAL (1-0)
- ◆ RECREATION CENTER - 1
- ◆ PARKS AND PLACHOUDS (SEE LIST BELOW)
- ◆ THORN CREEK SEWAGE TREATMENT PLANT (1-0)
- ◆ BLOOM TWP & MARION HIGH SCHOOLS
- ◆ CITY GARAGE (1-0)
- ◆ JONES MEMORIAL COMMUNITY CENTER (1-0)

COMMUNITY C  
SCHOOLS

- | PUBLIC                                       | PAROCHIAL   |
|--|---|
| 1 GAVIN (LIMESTONE TOWN) (n-1)               | A ST ANNE'S (1-1)   |
| 2 GARFIELD (n-1)                             | B ST AGNES' (1-1)   |
| 3 GREENBRIAR (1-1)                           | C ST HOCCO (1-1)  |
| 4 HIGHLANDS (n-2)                            | D ST JOSEPH (1-1)   |
| 5 JEFFERSON (n-2)                            | E ST PAULS LUTH (n-2)   |
| 6 LINCOLN (1-2)                              | F SAINT MIERAN (n-1)  |
| 7 ROOSEVELT (1-1)                            | G SEVENTH DAY ADVENTIST (1-2)                                       |
| 8 WASHINGTON & MC KINLEY (n-2)<br>JAMES ALEX |   |
| 9 WILSON (n-2)                               |   |
| 10 SERENA HILLS (n-1)                        |   |
| 11 BEACON HILLS (1-1)                        | 12 KENNEDY (1-1) 13 ELMWOOD (n-2) 14 GRANT (n-1)<br>(HOMERAY) (n-2) |

## PARKS & PLAYGROUNDS

- |   |   |    |                    |
|---|---|----|--------------------|
| 1 | THOMAS SMITH                              | 10 | BEACON HILLS (1-2) |
| 2 | EUCLED (1-6)                              | 11 | SARGANOH (1-7)     |
| 3 | KING (1-10) (1-1) (1-1) (1-1) (1-1) (1-1) | 12 | WELDON (1-1)       |
| 4 | WACHNER (1-9)                             | 13 | 207TH ST (1-2)     |
| 5 | NATHAN SIEPER (1-12)                      | 14 | WEDDELL (1-2)      |
| 6 | JIRTLE (1-9)                              |    |                    |
| 7 | LANDEN (1-6)                              |    |                    |
| 8 | CORNETTI (1-1)                            |    |                    |
| 9 | NORTH END (1-2)                           |    |                    |

## NOTE

"THIS MAP WAS DEVELOPED FROM AVAILABLE HISTORIC DATA AND OTHER FIELD REVIEWED INFORMATION. NO DETAILED HYDROLOGIC OR HYDRAULIC ANALYSES WERE MADE."













